National Science Education Standards Matrices

Tremor Troop
Link to National Science Education Standards

Unit/ Grades	Science as Inquiry	Physical Science	Earth & Space Sci.	Science & Technology	Sci. in Personal & Social Perspectives	History & Nature of Science	Unifying Concepts & Processes
I.1	D	D	D	D	I	I	D
I.2	D	D	D	D	I	I	D
I.3	D	D	D		D	D	D
II.1	I	D	D	I			D
II.2	D	D	D	D		I	D
II.3	I	D	D		D		D
III.1	I	D	D	I	I		D
III.2	D	D	D		I		D
III.3	I	D	D			I	D
IV.1	D	D	D	D	I		D
IV.2	D	D	D	D	I		D
IV.3	D	D	D	D	I	I	D
V. Part 1		D	D	I	D		D
V. Part 2	I	D	I	I	D		I
V. Part 3				I	D		I
V. Part 4				I	D		

D = Direct Connection
I = Indirect Connection

Unit I: Defining an Earthquake

National Science Education Standards

Tremor Troop: Earthquakes	Science as Inquiry	Physical Science	Earth and Space Science	Science and Technology
I.1 People Explain Earthquakes Students explore their personal experiences with earthquakes and observe a simulated earthquake by building an earthquake model. They also learn about earthquake legends and suggest possible causes of earthquakes and the structure of the Earth's interior.	**Abilities related to scientific inquiry** Understanding about scientific inquiry	**Position and motion of objects**	Properties of Earth materials **Changes in the Earth and sky**	**Understanding about science and technology**
I.2 People Explain Earthquakes Students explore personal experiences with earthquakes and communicate their thoughts about the causes of earthquakes. They identify and compare cultures that developed legends explaining earthquakes and learn what scientists believe cause earthquakes.	**Abilities related to scientific inquiry** Understanding about scientific inquiry	**Position and motion of objects**	**Changes in the Earth and sky**	**Understanding about science and technology**
I.3 Energy Waves Cause Earthquakes Students conduct investigations to simulate earthquakes and explain how they relate to events on Earth. They identify and compare locations of earthquakes and relate earthquake sites to legends and cultures.	**Abilities related to scientific inquiry** Understanding about scientific inquiry	**Motions and forces** **Transfer of energy**	**Structure of the Earth system** **Earth's history**	

Unit I: Defining an Earthquake

National Science Education Standards

Tremor Troop: Earthquakes	Science in Personal and Social Perspectives	History and Nature of Science	Unifying Concepts and Processes	
I.1 People Explain Earthquakes Students explore their personal experiences with earthquakes and observe a simulated earthquake by building an earthquake model. They also learn about earthquake legends and suggest possible causes of earthquakes and the structure of the Earth's interior.	Personal health Changes in Environments	Science as a human endeavor	Systems, order, and organization **Evidence, models, and explanation**	
I.2 People Explain Earthquakes Students explore personal experiences with earthquakes and communicate their thoughts about the causes of earthquakes. They identify and compare cultures that developed legends explaining earthquakes and learn what scientists believe cause earthquakes.	Personal health Changes in Environments	Science as a human endeavor	**Systems, order, and organization** **Evidence, models, and explanation**	
I.3 Energy Waves Cause Earthquakes Students conduct investigations to simulate earthquakes and explain how they relate to events on Earth. They identify and compare locations of earthquakes and relate earthquake sites to legends and cultures.	Personal health **Natural hazards** Risks and benefits	Science as a human endeavor Nature of science **History of science**	Systems, order, and organization **Evidence, models, and explanation**	

Unit II: Why and Where Earthquakes Occur

National Science Education Standards

Tremor Troop: Earthquakes	Science as Inquiry	Physical Science	Earth and Space Science	Science and Technology
II.1 Inside Planet Earth Students name, identify, and observe a model of Earth's layers and plates and construct representations of each.	Abilities related to scientific inquiry Understanding about scientific inquiry	Properties of objects and materials **Position and motion of objects**	Properties of Earth materials **Changes in the Earth and sky**	Understanding about science and technology
II.2 Plates Going Places Students describe, name, and identify the interior and layers of the Earth. They construct models of the Earth that demonstrate the way the surface is affected by interior movements.	**Abilities related to scientific inquiry** Understanding about scientific inquiry	Properties of objects and materials **Position and motion of objects**	Properties of Earth materials **Changes in the Earth and sky**	**Understanding about science and technology**
II.3 Layers, Plates, and Quakes Students construct models of the Earth's layers and describe the composition of the layers and the effects of activity at plate boundaries. They investigate convection as a model of plate movement.	Abilities necessary to do scientific inquiry Communicate scientific procedures and explanations Use mathematics in all aspects of scientific inquiry	**Motions and forces**	**Structure of the Earth system** **Earth's history**	

National Science Education Standards

Tremor Troop: Earthquakes	Science in Personal and Social Perspectives	History and Nature of Science	Unifying Concepts and Processes	
II.1 Inside Planet Earth Students name, identify, and observe a model of Earth's layers and plates and construct representations of each.			**Systems, order, and organization** **Evidence, models, and explanation**	
II.2 Plates Going Places Students describe, name, and identify the interior and layers of the Earth. They construct models of the Earth that demonstrate the way the surface is affected by interior movements.			**Systems, order, and organization** **Evidence, models, and explanation** Constancy, change, and environment	
II.3 Layers, Plates, and Quakes Students construct models of the Earth's layers and describe the composition of the layers and the effects of activity at plate boundaries. They investigate convection as a model of plate movement.	**Natural hazards** Risks and benefits	History of science	**Systems, order, and organization** **Evidence, models, and explanation** Constancy, change, and environment	

Unit III: Physical Results of Earthquakes

National Science Education Standards

Tremor Troop: Earthquakes	Science as Inquiry	Physical Science	Earth and Space Science	Science and Technology
III.1 Earthquakes Shape Our Earth Students demonstrate two types of faults and construct a model of a rural community to demonstrate the effect of an earthquake.	Abilities related to scientific inquiry Understanding about scientific inquiry	**Position and motion of objects**	**Changes in the Earth and sky**	Understanding about science and technology
III.2 Landscape on the Loose Students describe land features that result from earthquake activity and construct models of fault types. They demonstrate the formation of land features and events from earthquakes.	**Abilities related to scientific inquiry** **Understanding about scientific inquiry**	Properties of objects and materials **Position and motion of objects**	Properties of Earth materials **Changes in the Earth and sky**	
III.3 Building Up and Breaking Down Students describe and construct models of major landscape features. They relate these models to actual locations and demonstrate underwater activity that relates to earthquakes.	Abilities necessary to do scientific inquiry Communicate scientific procedures and explanations	**Motions and forces**	**Structure of the Earth system** **Earth's history**	

Unit III: Physical Results of Earthquakes

National Science Education Standards

Tremor Troop: Earthquakes	Science in Personal and Social Perspectives	History and Nature of Science	Unifying Concepts and Processes	
III.1 Earthquakes Shape Our Earth Students demonstrate two types of faults and construct a model of a rural community to demonstrate the effect of an earthquake.	Personal health Changes in Environments		**Systems, order, and organization** **Evidence, models, and explanation** Constancy, change, and environment	
III.2 Landscape on the Loose Students describe land features that result from earthquake activity and construct models of fault types. They demonstrate the formation of land features and events from earthquakes.	Personal health Changes in Environments		**Systems, order, and organization** **Evidence, models, and explanation** Constancy, change, and environment	
III.3 Building Up and Breaking Down Students describe and construct models of major landscape features. They relate these models to actual locations and demonstrate underwater activity that relates to earthquakes.		History of science	**Systems, order, and organization** **Evidence, models, and explanation** Constancy, change, and environment	

Unit IV: Measuring Earthquakes

National Science Education Standards

Tremor Troop: Earthquakes	Science as Inquiry	Physical Science	Earth and Space Science	Science and Technology
IV.1 Earthquakes Great and Small Students demonstrate earthquake simulation of different strengths and compare damage of each. They also demonstrate the length of time associated with earthquakes.	**Abilities related to scientific inquiry** **Understanding about scientific inquiry**	**Position and motion of objects**	**Changes in the Earth and sky**	**Abilities of Technological Design**
IV.2 Different Shakes for Different Quakes Students demonstrate simulations of various earthquake strengths and describe techniques for measuring earthquakes. They demonstrate a technique for recording earthquake movements and a method used to measure earthquakes.	**Abilities related to scientific inquiry** **Understanding about scientific inquiry**	**Position and motion of objects**	**Changes in the Earth and sky**	**Abilities of Technological Design** **Understanding about science and technology**
IV.3 Sizing Up Earthquake Waves Students simulate earthquake waves and construct a model for measuring earthquake waves. They also identify events associated with earthquakes and interpret data about intensity of earthquakes.	Abilities necessary to do scientific inquiry Communicate scientific procedures and explanations	**Motions and forces** **Transfer of energy**	Structure of the Earth system **Earth's history**	**Abilities of Technological Design** Communicate the Process of Technological Design

National Science Education Standards

Tremor Troop: Earthquakes	Science in Personal and Social Perspectives	History and Nature of Science	Unifying Concepts and Processes	
IV.1 Earthquakes Great and Small Students demonstrate earthquake simulation of different strengths and compare damage of each. They also demonstrate the length of time associated with earthquakes.	Personal health Changes in Environments		**Systems, order, and organization** **Evidence, models, and explanation** **Constancy, change, and environment**	
IV.2 Different Shakes for Different Quakes Students demonstrate simulations of various earthquake strengths and describe techniques for measuring earthquakes. They demonstrate a technique for recording earthquake movements and a method used to measure earthquakes.	Personal health Changes in Environments		**Systems, order, and organization** **Evidence, models, and explanation** Constancy, change, and environment	
IV.3 Sizing Up Earthquake Waves Students simulate earthquake waves and construct a model for measuring earthquake waves. They also identify events associated with earthquakes and interpret data about intensity of earthquakes.	Natural hazards Risks and benefits	Science as a human endeavor Nature of science	**Systems, order, and organization** **Evidence, models, and explanation** **Constancy, change, and environment**	

National Science Education Standards

Tremor Troop: Earthquakes	Science as Inquiry	Physical Science	Earth and Space Science	Science and Technology
V.Part 1: What Happens During an Earthquake Students identify areas of risk for earthquakes in the United States. They identify and describe events that occur during earthquakes, and they demonstrate safe behavior during an earthquake simulation.		Position and motion of Objects **Motion and Forces** **Transfer of Energy**	Changes in the Earth and sky **Structure of the Earth System** **Earth's History**	Abilities of Technological Design Understanding about Science and Technology
V.Part 2: Hunt for Hazards Students identify potential hazards in school and home and list possible ways to reduce hazards.	Abilities necessary to do scientific inquiry	**Properties of Objects and Materials**	Properties of Earth Materials	**Abilities of Technological Design** Communicate a Problem, Design, and Solution Understanding about Science and Technology
V.Part 3: Prepare and Share Students identify and assemble an emergency kit and communicate earthquake safety information to others.				Abilities of Technological Design Communicate the Process of Technological Design
V.Part 4: Evacuation Drill Students identify hazards during an evacuation and describe ways of helping others who are injured during earthquakes. They describe feelings and dangers associated with earthquakes.				Abilities of Technological Design Communicate the Process of Technological Design

Unit V: Earthquake Safety and Survival

National Science Education Standards

Tremor Troop: Earthquakes	Science in Personal and Social Perspectives	History and Nature of Science	Unifying Concepts and Processes	
V.Part 1: What Happens During an Earthquake Students identify areas of risk for earthquakes in the United States. They identify and describe events that occur during earthquakes, and they demonstrate safe behavior during an earthquake simulation.	**Personal health** **Changes in Environments** Natural Hazards Risks and Benefits		**Systems, order, and organization** Evidence, models, and explanation Constancy, change, and environment Form and function	
V.Part 2: Hunt for Hazards Students identify potential hazards in school and home and list possible ways to reduce hazards.	**Personal health** **Changes in Environments** **Science and Technology in Local Challenges**		Systems, order, and organization Evidence, models, and explanation Constancy, change, and environment Form and function	
V.Part 3: Prepare and Share Students identify and assemble an emergency kit and communicate earthquake safety information to others.	**Personal health** **Types of Resources** **Changes in Environments** **Science and Technology in Local Challenges**		Systems, order, and organization Evidence, models, and explanation Constancy, change, and environment Form and function	
V.Part 4: Evacuation Drill Students identify hazards during an evacuation and describe ways of helping others who are injured during earthquakes. They describe feelings and dangers associated with earthquakes.	**Personal health** **Changes in Environments** **Science and Technology in Local Challenges** **Natural Hazards** **Risks and Benefits**			